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     (FILE 'HOME' ENTERED AT 12:13:22 ON 28 JAN 2004)

     INDEX 'ADISCTI, ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, AQUASCI,
     BIOBUSINESS, BIOCOMMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA,
     CANCERLIT, CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB, CROPU, DISSABS,
     DDFB, DDFU, DGENE, DRUGB, DRUGMONOG2, ...' ENTERED AT 12:13:30 ON 28 JAN
     2004
               SEA ISOMALTOSYLTRANSFERASE OR (ISOMALTOSYL TRANSFERASE)
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              4    FILE BIOSIS
              7    FILE BIOTECHABS
              7    FILE BIOTECHDS
              2    FILE BIOTECHNO
             14    FILE CAPLUS
             99    FILE DGENE
              2    FILE EMBASE
              2    FILE ESBIOBASE
              3    FILE FROSTI
              5    FILE FSTA
              6    FILE GENBANK
              4    FILE JICST-EPLUS
              4    FILE LIFESCI
              2    FILE MEDLINE
              3    FILE PASCAL
              5    FILE SCISEARCH
              1    FILE TOXCENTER
              6    FILE WPIDS
              6    FILE WPINDEX
L1             QUE ISOMALTOSYLTRANSFERASE OR (ISOMALTOSYL TRANSFERASE)
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     FILE 'CAPLUS, BIOTECHDS, WPIDS, FSTA, SCISEARCH, BIOSIS, JICST-EPLUS,
     LIFESCI, FROSTI, PASCAL, BIOTECHNO, EMBASE, ESBIOBASE, MEDLINE,
     TOXCENTER' ENTERED AT 12:15:14 ON 28 JAN 2004
L2            56 S L1 AND (BACILLUS OR ARTHROBACTER)
L3            36 S L2 AND (ISOLAT? OR PURIF? OR CHARACTER?)
L4            13 DUP REM L3 (23 DUPLICATES REMOVED)
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L4 ANSWER 10 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 5

ACCESSION NUMBER: 2002:430804 CAPLUS
DOCUMENT NUMBER: 138:852
TITLE: Cloning and sequencing of the genes encoding cyclic tetrasaccharide-synthesizing enzymes from **Bacillus** globisporus C11
AUTHOR(S): Aga, Hajime; Maruta, Kazuhiko; Yamamoto, Takuo; Kubota, Michio; Fukuda, Shigeharu; Kurimoto, Masashi; Tsujisaka, Yoshio
CORPORATE SOURCE: Hayashibara Biochemical Laboratories, Amase Institute, Okayama, 700-0834, Japan
SOURCE: Bioscience, Biotechnology, and Biochemistry (2002), 66(5), 1057-1068
CODEN: BBBIEJ; ISSN: 0916-8451
PUBLISHER: Japan Society for Bioscience, Biotechnology, and Agrochemistry
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The genes for **isomaltosyltransferase** (CtsY) and 6-glucosyltransferase (CtsZ), involved in synthesis of a cyclic tetrasaccharide from .alpha.-glucan, have been cloned from the genome of **Bacillus** globisporus C11. The amino-acid sequence deduced from the ctsY gene is composed of 1093 residues having a signal sequence of 29 residues in its N-terminus. The ctsZ gene encodes a protein consisting of 1284 residues with a signal sequence of 35 residues. Both of the gene products show similarities to .alpha.-glucosidases belonging to glycoside hydrolase family 31 and conserve two aspartic acids corresponding to the putative catalytic residues of these enzymes. The two genes are linked together, forming ctsYZ. The DNA sequence of 16,515 bp analyzed in this study contains four open reading frames (ORFs) upstream of ctsYZ and one ORF downstream. The first six ORFs, including ctsYZ, form a gene cluster, ctsUVWXYZ. The amino-acid sequences deduced from ctsUV are similar in to a sequence permease and a sugar-binding protein for the sugar transport system from Thermococcus sp. B1001. The third ctsW encodes a protein similar to CtsY, suggested to be another **isomaltosyltransferase** preferring panose to high-mol.-mass substrates.

=> d l4 ibib ab 1-13

L4 ANSWER 1 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2003:424469 CAPLUS
DOCUMENT NUMBER: 139:6073
TITLE: Cyclic tetrasaccharide for inhibition of decrease of active oxygen-scavenging activity and its compositions suitable for foods, cosmetics, and pharmaceuticals
INVENTOR(S): Oku, Kazuyuki; Kubota, Norio; Fukuda, Shigeharu; Miyake, Toshio
PATENT ASSIGNEE(S): Hayashibara Biochemical Laboratories, Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003160495	A2	20030603	JP 2001-355273	20011120
EP 1321148	A1	20030625	EP 2002-257948	20021119
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK				
US 2003108593	A1	20030612	US 2002-299678	20021120

PRIORITY APPLN. INFO.: JP 2001-355273 A 20011120
AB Plant-derived active O-scavenging substances are mixed with cyclo[-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.6)-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.6)] (I) or its mixts. with trehalose, pullulan, and/or cyclodextrin in the presence of aq. media for inhibition of decrease of active O-scavenging activity. An aq. soln. (.apprx.100 L) contg. 4% (wt./vol.) phytoglycogen from corn was treated with an enzyme prepn. (contg. .alpha.-isomaltosylglucosaccharide-producing enzyme and .alpha.-**isomaltosyltransferase**, produced by **Bacillus** globisporus) at 30.degree. and pH 6.0 for 48 h and the reaction mixt. was **purified** to give 1170 g I of .gtoreq.99.9% purity. A powd. compn. contg. carrot 47.9, I 45.7, and H2O 6.4 wt.% showed active O-scavenging activity of 590 and 390 U/g before and after 7-day storage at 40.degree. in a sealed polystyrene container, resp., showing 66% residual activity after storage. Formulation examples of food compns., nutrient compns., cosmetics, bath prepns., and ointments are given.

L4 ANSWER 2 OF 13 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN
ACCESSION NUMBER: 2003-16964 BIOTECHDS
TITLE: Manufacture of isomaltose in two-step process from specified sugar types using specified enzymes, for manufacture of isomaltitol and use in foodstuffs, fodder, pharmaceuticals and cosmetics;
using alpha-isomaltosyl gluco-sugar synthase, alpha-**isomaltosyl transferase** and dehydrogenase useful for beverage, health food, humectant, osmotic pressure regulator, sugar crystallization-inhibitor, starch aging-inhibitor
AUTHOR: KUBOTA M; NISHIMOTO T; SONODA T; FUKUDA S; MIYAKE T
PATENT ASSIGNEE: HAYASHIBARA SEIBUTSU KAGAKU
PATENT INFO: WO 2003033717 24 Apr 2003
APPLICATION INFO: WO 2002-JP10846 18 Oct 2002
PRIORITY INFO: JP 2002-252609 30 Aug 2002; JP 2001-321182 18 Oct 2001
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
OTHER SOURCE: WPI: 2003-430348 [40]
AB DERWENT ABSTRACT:

NOVELTY - Manufacture of isomaltose comprises making one or more alpha-isomaltosyl gluco-sugar synthase, in the presence or absence of alpha-**isomaltosyl transferase** act on a sugar of glucose polymerization degree of two or more having alpha-1,4-glucosyl bonds as the bonding of the non-reducing terminal to give a alpha-isomaltosylglucosugar with glucose polymerization degree of 3 or more; acting on this with isomaltose release enzyme.

DETAILED DESCRIPTION - Manufacture of isomaltose comprises: (a) making one or more alpha-isomaltosyl gluco-sugar synthase from **Bacillus** globisporus N75 (FERM BP-7591), **Arthrobacter** globiformis A19 (FERM BP-7590) and **Arthrobacter** ramosus S1 (FERM BP-7592), in the presence or absence of alpha-**isomaltosyl transferase** from **Bacillus** globisporus N75 (FERM BP-7591) and/or **Arthrobacter** globiformis A19 (FERM BP-7590) act on a sugar of glucose polymerization degree of two or more having alpha-1,4-glucosyl bonds as the bonding of the non-reducing terminal to give a alpha-isomaltosylglucosugar with glucose polymerization degree of three or more having a alpha-1,6-glucosyl bond as a non-reducing terminal and alpha-1,4-glucosyl bonds as the other terminals, and/or cyclo(-6)-alpha-D-glucopyranosyl-(1-3)-alpha-D -glucopyranosyl-(1-6)-alpha-D -glucopyranosyl-(1-3)-alpha-D-glucopyranosyl-(1-); (b) acting on this with isomaltose release enzyme; and (c) collecting the isomaltose. INDEPENDENT CLAIMS are also included for: (1) production of isomaltose from a mixture of two or more of cyclo(-6)-alpha-D-glucopyranosyl-(1-3)-alpha-D-glucopyranosyl-(1-6)-alpha-D-glucopyranosyl-(1-3)-alpha-D-glucopyranosyl-(1-), alpha-glucosyl-(1-6)-alpha-glucosyl-(1-3)-alpha-glucosyl-(1-6)-alpha-glucosyl-(1-3)-alpha-glucose and panose by the action of isomaltose release enzyme; (2) a sugar mixture containing isomaltose obtained by one of these methods, whose solids composition is 40-99 wt.% isomaltose, and 1-60 wt.% of one or more of glucose, maltose, maltotriose, maltotetraose, starch hydrolysis product, alpha-isomaltosyl glucosugar and alpha-glucosyl-(1-6)-alpha-glucosyl-(1-3)-alpha-glucosyl-(1-6)-alpha-glucosyl-(1-3)-alpha-glucose; (3) production of isomaltitol by treating the isomaltose, optionally after separation, with a dehydrogenase; (4) a sugar mixture containing isomaltitol with solids composition as in (2) except that the isomaltose has been converted to isomaltitol; and (5) alpha-**Isomaltosyl transferase** from **Bacillus** globisporus N75 (FERM BP-7591) which has the amino acid sequence from 50 to 1121 of sequence 26.

USE - The isomaltose and isomaltitol are used in health foods and beverages, fodder and feeds, cosmetics and pharmaceuticals (claimed), and luxury articles, as humectants, osmotic pressure regulators, low sweetness, sugar crystallization inhibitors, and starch aging inhibitors.

ADVANTAGE - Large amounts of isomaltitol can be produced in high yield at low cost.

EXAMPLE - An aqueous solution of phytoglycogen from corn starch (100 l water: 4 w/v%) was adjusted to pH 6.0, 30 degrees C, and treated with 1 unit per gram starch of alpha-isomaltosyl gluco-sugar synthase and 12 units per gram starch of alpha-**isomaltosyl transferase** , both from **Bacillus** globisporus N75 (FERM BP-7591). After 48 hours of reaction, the enzymes were inactivated at 100 degrees C for 10 minutes. 80 % Of the sugars were tetraose. The reaction liquid was adjusted to pH 5.0, 45 degrees C, and treated with 1500 units alpha-glucosidase and 75 units glucoamylase per gram starch for 24 hours, to hydrolyse remaining reducing oligosugars. The enzymes were inactivated at pH 5.8, 90 degrees C for 1 hour. The liquid was filtered and the filtrate was concentrated by reverse osmosis to 16 % solids, decolored, desalted, filtered and concentrated to give 6 kg of solution containing 3.5 kg solids. A fraction containing 80 % or more cyclic tetraose was separated using an ion exchange column, and this fraction was decolored, desalted, filtered and concentrated to give a solution containing 95.5 % cyclic tetraose. This was concentrated to dryness at reduced pressure. The powder obtained was dissolved, desalted, adjusted to a concentration of 1 %, pH 5.5, 50 degrees C and treated with 80 units isomaltose release

enzyme from **Arthrobacter** globiformis T6 (IAM 12103) per gram solids, and incubated for 70 hours. The solution was heated to 95 degrees C for 10 minutes then cooled, filtered, decolored, desalted, and **purified**, and concentrated to 43 % to give a syrup of isomaltose (95 % yield of solids). The syrup contained 43.1 % isomaltose, 37.8 % ring-opened tetraose and 13.8 % cyclic tetraose. (260 pages)

L4 ANSWER 3 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
ACCESSION NUMBER: 2003:466325 CAPLUS
DOCUMENT NUMBER: 139:333776
TITLE: 6-.alpha.-glucosyltransferase and 3-.alpha.-**isomaltosyltransferase** from **Bacillus** globisporus N75
AUTHOR(S): Aga, Hajime; Nishimoto, Tomoyuki; Kuniyoshi, Mieko; Maruta, Kazuhiko; Yamashita, Hiroshi; Higashiyama, Takanobu; Nakada, Tetsuya; Kubota, Michio; Fukuda, Shigeharu; Kurimoto, Masashi; Tsujisaka, Yoshio
CORPORATE SOURCE: Amase Institute, Hayashibara Biochemical Laboratories, Inc., Okayama, 700-0834, Japan
SOURCE: Journal of Bioscience and Bioengineering (2003), 95(3), 215-224
CODEN: JBBIF6; ISSN: 1389-1723
PUBLISHER: Society for Biotechnology, Japan
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A bacterial strain, **Bacillus** globisporus N75, produced two glycosyltransferases, 6-.alpha.-glucosyltransferase (6GT) and 3-.alpha.-**isomaltosyltransferase** (IMT), jointly catalyzing formation of cyclo{.fwdarw.6)-.alpha.-D-Glcp-(1.fwdarw.3)-.alpha.-D-Glcp-(1.fwdarw.6)-.alpha.-D-Glcp-(1.fwdarw.3)-.alpha.-D-Glcp-(1.fwdarw.} (CTS) from .alpha.-1,4-glucan. The N75 enzymes produced CTS from dextrin in a 43.8% yield at the reaction temp. of 50.degree., which was 10.degree. higher than a crit. temp. of CTS-forming by the enzymes from B. globisporus C11. The optimum temps. for 6GT and IMT reactions were 55.degree. and 50.degree., resp. The thermal stability of both enzymes was 45.degree. under the condition at pH 6.0 for 60 min. The genes for 6GT and IMT were cloned from the genomic DNA of N75. The amino acid sequences deduced from the 6GT and IMT genes showed 82% and 85% identities, resp., to the sequences of the enzymes from C11. CTS yield was decreased by high concns. of the substrate. It was found that the reaction yield was improved by adding cyclomaltodextrin glucanotransferase (CGTase). We demonstrated mass-prodn. of CTS from starch by using the N75 enzymes and CGTase.
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 4 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
ACCESSION NUMBER: 2002:539841 CAPLUS
DOCUMENT NUMBER: 137:105736
TITLE: .alpha.-Isomaltosylglucosaccharide synthase from **Bacillus** and **Arthrobacter** catalyzing synthesis of cyclic tetrasaccharide, and food applications
INVENTOR(S): Kubota, Michio; Maruta, Kazuhiko; Yamamoto, Takuo; Fukuda, Shigeharu
PATENT ASSIGNEE(S): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Japan
SOURCE: PCT Int. Appl., 144 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002055708	A1	20020718	WO 2002-JP52	20020109
W: AU, CA, CN, JP, KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
EP 1361274	A1	20031112	EP 2002-715715	20020109
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				

PRIORITY APPLN. INFO.: JP 2001-5441 A 20010112
WO 2002-JP52 W 20020109

AB .alpha.-Isomaltosylglucosaccharide synthase capable of forming a cyclic tetrasaccharide having a cyclo {.fwdarw.6} -.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.6)-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.) structure via a reaction involving .alpha.-isomaltosyl transfer starting from a saccharide having an .alpha.-1,6-glucosyl bond at the non-reducing end and an .alpha.-1,4-glucosyl bond at the other ends and having a degree of glucose polymn. of at least 3, is provided. Also, recombinant expression of the above enzyme in microorganisms, use in prodn. of the cyclic tetrasaccharide, and use of such sugars in food, such as syrup, are claimed. Use of .alpha.-**isomaltosyltransferase** in combination with the above mentioned .alpha.-isomaltosylglucosaccharide synthase in the synthesis of cyclic tetrasaccharides and carbohydrates contg. it, is claimed. **Bacillus** globisporus, or **Arthrobacter** globiformis, can be used as expression host. **Isolation** of the enzyme from **Bacillus** globisporus C11, N75 strains, and **Arthrobacter** globiformis A19, and **characterization** of catalytic activity, including pH optimum, temp. optimum, and substrate specificity, are described. When maltose was used as substrate, glucose and .alpha.-maltosyl glucose (62-O-.alpha.-glucosyl maltose) were produced. From maltotriose, mainly maltose and .alpha.-maltosyl maltose (63-O-.alpha.-glucosyl maltotriose) were produced with minor prodn. of glucose, maltotetraose, .alpha.-maltosyl glucose, and .alpha.-isomaltosyl maltotriose (64-O-.alpha.-glucosyl maltotetraose). From maltotetraose, maltotriose and .alpha.-isomaltosyl maltotriose were the major products, with minor prodn. of maltose, maltopentaose, .alpha.-maltosyl maltose, and .alpha.-isomaltosyl maltotetraose (65-O-.alpha.-glucosyl maltopentaose).

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 5 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 3
ACCESSION NUMBER: 2002:391867 CAPLUS
DOCUMENT NUMBER: 136:382190
TITLE: .alpha.-**Isomaltosyltransferase** catalyzing synthesis of cyclic tetrasaccharide from **Bacillus**, **isolation** and recombinant expression
INVENTOR(S): Kubota, Michio; Maruta, Kazuhiko; Yamamoto, Takuo; Fukuda, Shigeharu
PATENT ASSIGNEE(S): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Japan
SOURCE: PCT Int. Appl., 108 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002040659	A1	20020523	WO 2001-JP10044	20011116
W: JP, KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,				

PT, SE, TR
EP 1335020 A1 20030813 EP 2001-996600 20011116
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR
PRIORITY APPLN. INFO.: JP 2000-350142 A 20001116
WO 2001-JP10044 W 20011116

AB .alpha.-**Isomaltosyltransferase** capable of forming a cyclic tetrasaccharide having a cyclo {-6} -.alpha.-D-glucopyranosyl- (1-3) -.alpha.-D-glucopyranosyl- (1-6) -.alpha.-D-glucopyranosyl- (1-3) -.alpha.-D-glucopyranosyl- (1-) structure via a reaction involving .alpha.-isomaltosyl transfer starting from a saccharide having an .alpha.-1,6-glucosyl bond at the non-reducing end and an .alpha.-1,4-glucosyl bond at the other end and having a degree of glucose polymn. of at least 3, is provided. **Isolation** of the enzyme from **Bacillus** globisporus C11 and N75 strains, and **characterization** of catalytic activity, including substrate specificity, are described. The enzyme used 62-O-.alpha.-glucosyl maltose, 63-O-.alpha.-glucosyl maltotriose, 64-O-.alpha.-glucosyl maltotriose, 65-O-.alpha.-glucosyl maltopentaose as substrate to produce cyclic tetrasaccharides and maltooligosaccharides having 2 d.p. less than the substrates.

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 6 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:107521 CAPLUS
DOCUMENT NUMBER: 136:163295
TITLE: .alpha.-Isomaltosylglucosaccharide synthase from **Bacillus** and **Arthrobacter** catalyzing synthesis of cyclic tetrasaccharide, and food, cosmetics, and pharmaceutical applications
INVENTOR(S): Kubota, Michio; Tsusaki, Keiji; Higashiyama, Takanobu; Fukuda, Shigeharu; Miyake, Toshio
PATENT ASSIGNEE(S): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Japan
SOURCE: PCT Int. Appl., 209 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002010361	A1	20020207	WO 2001-JP6412	20010725
W: AU, CA, CN, JP, KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
AU 2001080095	A5	20020213	AU 2001-80095	20010725
EP 1229112	A1	20020807	EP 2001-958377	20010725
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
US 2003194762	A1	20031016	US 2002-89549	20020401

PRIORITY APPLN. INFO.: JP 2000-233364 A 20000801
JP 2000-234937 A 20000802
WO 2001-JP6412 W 20010725

AB .alpha.-Isomaltosylglucosaccharide synthase capable of forming a cyclic tetrasaccharide having a cyclo { - 6} -.alpha.-D-glucopyranosyl- (1-3) -.alpha.-D-glucopyranosyl- (1-6) -.alpha.-D-glucopyranosyl- (1-3) -.alpha.-D-glucopyranosyl- (1 -) structure via a reaction involving .alpha.-isomaltosyl transfer starting from a saccharide having an .alpha.-1,6-glucosyl bond at the non-reducing end and an .alpha.-1,4-glucosyl bond at the other end and having a degree of glucose polymn. of at least 3, is provided. Also, recombinant expression of the

above enzyme in microorganisms, use in prodn. of the cyclic tetrasaccharide, and use of such sugars in food, cosmetics, and pharmaceutical applications, are claimed. Use of .alpha.-**isomaltosyltransferase** in combination with the above mentioned .alpha.-isomaltosylglucosaccharide synthase in the synthesis of cyclic tetrasaccharides and carbohydrates contg. it, is claimed. Maltooligosaccharide, maltodextrin, amylodextrin, amylose, amylopectin, sol., liquefied, or glutinous starch, and glycogen, are the donor saccharides. D-glucose, D-xylose, L-xylose, D-galactose, D-fructose, D-mannose, D-arabinose, D-fucose, D-psicose, D-sorbose, methyl-.alpha.-glucose, methyl-.beta.-glucose, N-acetylglucosamine, trehalose, isomaltose, isomaltotriose, cellobiose, gentiobiose, glycerol, maltitol, lactose, sucrose, or L-ascorbic acid, are the acceptor saccharides. The enzyme activity is stabilized by Ca2+, and Mn2+, and inhibited by Hg2+, Cu2+, and EDTA. **Bacillus** globisporus, or **Arthrobacter** globiformis, can be used as expression host. **Isolation** of the enzyme from **Bacillus** globisporus C9, C11, N75 strains, and **Arthrobacter** globiformis, and **characterization** of catalytic activity, including substrate specificity, are described.

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 7 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN
ACCESSION NUMBER: 2002:688160 CAPLUS
DOCUMENT NUMBER: 137:217171
TITLE: Preparation of carbohydrate mixture containing .alpha.-isomaltosylmaltotriose and sugar alcohols and method for production thereof
INVENTOR(S): Kubota, Norio; Nishimoto, Tomoyuki; Aga, Hajime; Fukuda, Yoshiharu; Miyake, Toshio
PATENT ASSIGNEE(S): Hayashibara Biochemical Laboratories, Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 47 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002255988	A2	20020911	JP 2001-60460	20010305

PRIORITY APPLN. INFO.: JP 2001-60460 20010305

AB A carbohydrate mixt. contg. cyclo[-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.6)-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.6)] (.alpha.-isomaltosylmaltotriose or 64-O-.alpha.-glucosylmaltotetraose) (I) and sugar alcs. is prepd. by redn. of a carbohydrate mixt. contg. the cyclic tetrasaccharide compd. I and reducing sugars to decrease the reducibility. The starting carbohydrate mixt. is obtained by reaction of .alpha.-isomaltosylglucosaccharide with .alpha.-**isomaltosyl transferase** or reaction of partially hydrolyzed product of starch having DE (dextrose equiv.) of .ltoreq.20 with .alpha.-isomaltosylglucosaccharide synthase and .alpha.-**isomaltosyl transferase**. Also disclosed are beverages, in particular low calorie beverages, cosmetics, or drugs contg. the above carbohydrate mixt. The present carbohydrate mixt. is a stable sweetening agent which is useful as a taste or flavor improver, quality improver, or excipient for beverages, food, feed, cosmetics, or drugs. Thus, a liq. fermn. medium (100 mL) contg. Pindex 1 5, yeast ext. (Asahi Meast) 1.5, k2HPO4 0.1, NaH2PO4.12H2O 0.06, MgSO4.7H2O 0.05 wt./vol. % and H2O was sterilized under heating at 120.degree. for 20 min, cooled, inoculated by **Bacillus** globisporus C9 (FERM BP-7143), shake-cultured at 27.degree. for 48 h, and centrifuged to obtain a supernatant liq. which

was heated at 120.degree. for 15 min, cooled, and centrifuged to give a supernatant liq. The supernatant liq. (90 mL) was adjusted to pH 5.0 and warmed to 40.degree., treated with 1,500 unit .alpha.-glucosidase (transglycosidase L [Amano] J) and 75 unit glucoamylase (Nagase Biochem. Industry Inc., Japan) for 24 h, adjusted to pH 12, boiled for 2 h to decomp. residual reducing sugars, filtered, and desalted by Diaion PK218 and Diaion WA30 and then again with Diaion SK-1B and IRA 411 to give .apprx.0.6 g I (99.9% purity). I was stable in aq. AcOH (pH 3.0-5.0), Tris-HCl buffer (pH 6.0-8.0), ammonium buffer (9.0-10.0) at 100.degree. for 24 h and was not hydrolyzed by saliva amylase, and formed inclusion complexes with MeOH, EtOH, and AcOH. The two enzymes, i.e. .alpha.-isomaltosylglucosaccharide synthase and .alpha.-**isomaltosyl transferase**, were **isolated** and **purified** from the fermn. broth obtained similarly by fermn. of B. globisporus C9. In another expt., a fermn. broth of B. globisporus C9 contg. 8.8 unit/mL .alpha.-isomaltosyl glucosaccharide synthetase and 26.7 unit/mL .alpha.-**isomaltosyl transferase** was added at 0.25 mL/1 g starch to 2% aq. 1 mM potato starch contg. 1 mM CaCl2, adjusted to pH 6.0, stirred at 35.degree. for 48 h, heated at 95.degree. for 10 min, **purified** by decolorization and desaltation, and concd. to give a 40% syrup contg. I which was hydrogenated in the presence of 6% Raney nickel at 120.degree. and 20-120 kg/cm2, filtered to remove the catalyst, **purified** by decolorization and desaltation, and concd. to give a 70% syrup contg. I 62.1, sorbitol 0.7, isomaltitol 1.4, maltitol 11.1 and other sugars 24.7%. The carbohydrate mixt. exhibited mild sweetness, moderate viscosity, moisturizing property, and inclusion property.

L4 ANSWER 8 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4

ACCESSION NUMBER: 2002:785000 CAPLUS
DOCUMENT NUMBER: 138:102718
TITLE: **Purification** and **characterization** of glucosyltransferase and glucanotransferase involved in the production of cyclic tetrasaccharide in **Bacillus** globisporus C11
AUTHOR(S): Nishimoto, Tomoyuki; Aga, Hajime; Mukai, Kazuhisa; Hashimoto, Takaharu; Watanabe, Hikaru; Kubota, Michio; Fukuda, Shigeharu; Kurimoto, Masashi; Tsujisaka, Yoshio
CORPORATE SOURCE: Hayashibara Biochemical Laboratories, Inc., Okayama, 700-0834, Japan
SOURCE: Bioscience, Biotechnology, and Biochemistry (2002), 66(9), 1806-1818
CODEN: BBBIEJ; ISSN: 0916-8451
PUBLISHER: Japan Society for Bioscience, Biotechnology, and Agrochemistry
DOCUMENT TYPE: Journal
LANGUAGE: English

AB Glucosyltransferase and glucanotransferase involved in the prodn. of cyclic tetrasaccharide (CTS; cyclo {.fwdarw.6}-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.6)-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D- glucopyranosyl-(1.fwdarw.)) from .alpha.-1,4-glucan were **purified** from **Bacillus** globisporus C11. The former was a 1,6-.alpha.-glucosyltransferase (6GT) catalyzing the .alpha.-1,6-transglucosylaction of one glucosyl residue to the nonreducing end of maltooligosaccharides (MOS) to produce .alpha.-isomaltosyl-MOS from MOS. The latter was an **isomaltosyl transferase** (IMT) catalyzing .alpha.-1,3-, .alpha.-1,4-, and .alpha.,.beta.-1,1-intermol. transglycosylation of isomaltosyl residues. When IMT catalyzed .alpha.-1,3-transglycosylation, .alpha.-isomaltosyl-(1.fwdarw.3)-.alpha.-isomaltosyl-MOS was produced from .alpha.-isomaltosyl-MOS. In addn., IMT catalyzed cyclization, and produced CTS from .alpha.-isomaltosyl-(1.fwdarw.3)-.alpha.-isomaltosyl-MOS by intramol. transglycosylation. Therefore, the mechanism of CTS

synthesis from MOS by the two enzymes seemed to follow three steps:. (1) MOS.fwdarw..alpha.-isomaltosyl-MOS (by 6GT), (2) .alpha.-Isomaltosyl-MOS.fwdarw..alpha.-isomaltosyl-(1.fwdarw.3)-.alpha.-isomaltosyl-MOS (by IMT), and (3) .alpha.-Isomaltosyl-(1.fwdarw.3)-.alpha.-isomaltosyl-MOS.fwdarw.CTS + MOS (by IMT). The mol. mass of 6GT was estd. to be 137 kDa by SDS-PAGE. The optimum pH and temp. for 6GT were pH 6.0 and 45.degree., resp. This enzyme was stable at from pH 5.5 to 10 and on being heated to 40.degree. for 60 min. 6GT was strongly activated and stabilized by various divalent cations. The mol. mass of IMT was estd. to be 102 kDa by SDS-PAGE. The optimum pH and temp. for IMT were pH 6.0 and 50.degree., resp. This enzyme was stable at from pH 4.5 to 9.0 and on being heated to 40.degree. for 60 min. Divalent cations had no effect on the stability or activity of this enzyme.

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 9 OF 13 LIFESCI COPYRIGHT 2004 CSA on STN
ACCESSION NUMBER: 2003:94769 LIFESCI
TITLE: **Purification** and **Characterization** of Glucosyltransferase and Glucanotransferase Involved in the Production of Cyclic Tetrasaccharide in **Bacillus** globisporus C11
AUTHOR: Nishimoto, Tomoyuki; Aga, Hajime; Mukai, Kazuhisa; Hashimoto, Takaharu; Watanabe, Hikaru; Kubota, Michio; Fukuda, Shigeharu; Kurimoto, Masashi; Tsujisaka, Yoshio
CORPORATE SOURCE: Hayashibara Biochemical Laboratories, Inc. 7-7 Amase-minami machi, Okayama 700-0834, Japan
SOURCE: Bioscience, Biotechnology, and Biochemistry [Biosci., Biotechnol., Biochem.], (20020900) vol. 66, no. 9, p. 1806. ISSN: 0916-8451.
DOCUMENT TYPE: Journal
FILE SEGMENT: J
LANGUAGE: English
SUMMARY LANGUAGE: English

AB Glucosyltransferase and glucanotransferase involved in the production of cyclic tetrasaccharide (CTS; cyclo { arrow right 6}- alpha -D-glucopyranosyl-(1 arrow right 3)- alpha -D-glucopyranosyl- (1 arrow right 6)- alpha -D-glucopyranosyl-(1 arrow right 3)- alpha -D-glucopyranosyl-(1 arrow right)) from alpha -1,4-glucan were **purified** from **Bacillus** globisporus C11. The former was a 1,6- alpha -glucosyltransferase (6GT) catalyzing the alpha -1,6-transglucosylation of one glucosyl residue to the nonreducing end of maltooligosaccharides (MOS) to produce alpha -isomaltosyl-MOS from MOS. The latter was an **isomaltosyl transferase** (IMT) catalyzing alpha -1,3-, alpha -1,4-, and alpha , beta -1,1-intermolecular transglycosylation of isomaltosyl residues. When IMT catalyzed alpha -1,3-transglycosylation, alpha -isomaltosyl-(1 arrow right 3)- alpha -isomaltosyl-MOS was produced from alpha -isomaltosyl-MOS. In addition, IMT catalyzed cyclization, and produced CTS from alpha -isomaltosyl-(1 arrow right 3)- alpha -isomaltosyl-MOS by intramolecular transglycosylation. Therefore, the mechanism of CTS synthesis from MOS by the two enzymes seemed to follow three steps: 1) MOS arrow right alpha -isomaltosyl-MOS (by 6GT), 2) alpha -isomaltosyl-MOS arrow right alpha -isomaltosyl-(1 arrow right 3)- alpha -isomaltosyl-MOS (by IMT), and 3) alpha -isomaltosyl-(1 arrow right 3)- alpha -isomaltosyl-MOS arrow right CTS + MOS (by IMT). The molecular mass of 6GT was estimated to be 137 kDa by SDS-PAGE. The optimum pH and temperature for 6GT were pH 6.0 and 45 degree C, respectively. This enzyme was stable at from pH 5.5 to 10 and on being heated to 40 degree C for 60 min. 6GT was strongly activated and stabilized by various divalent cations. The molecular mass of IMT was estimated to be 102 kDa by SDS-PAGE. The optimum pH and temperature for IMT were pH 6.0 and 50 degree C, respectively. This enzyme was stable at from pH 4.5 to 9.0 and on being heated to 40 degree C for 60 min. Divalent cations had no effect on the stability or activity of this enzyme.

L4 ANSWER 10 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 5
ACCESSION NUMBER: 2002:430804 CAPLUS
DOCUMENT NUMBER: 138:852
TITLE: Cloning and sequencing of the genes encoding cyclic tetrasaccharide-synthesizing enzymes from **Bacillus** globisporus C11
AUTHOR(S): Aga, Hajime; Maruta, Kazuhiko; Yamamoto, Takuo; Kubota, Michio; Fukuda, Shigeharu; Kurimoto, Masashi; Tsujisaka, Yoshio
CORPORATE SOURCE: Hayashibara Biochemical Laboratories, Amase Institute, Okayama, 700-0834, Japan
SOURCE: Bioscience, Biotechnology, and Biochemistry (2002), 66(5), 1057-1068
CODEN: BBBIEJ; ISSN: 0916-8451
PUBLISHER: Japan Society for Bioscience, Biotechnology, and Agrochemistry
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The genes for **isomaltosyltransferase** (CtsY) and 6-glucosyltransferase (CtsZ), involved in synthesis of a cyclic tetrasaccharide from .alpha.-glucan, have been cloned from the genome of **Bacillus** globisporus C11. The amino-acid sequence deduced from the ctsY gene is composed of 1093 residues having a signal sequence of 29 residues in its N-terminus. The ctsZ gene encodes a protein consisting of 1284 residues with a signal sequence of 35 residues. Both of the gene products show similarities to .alpha.-glucosidases belonging to glycoside hydrolase family 31 and conserve two aspartic acids corresponding to the putative catalytic residues of these enzymes. The two genes are linked together, forming ctsYZ. The DNA sequence of 16,515 bp analyzed in this study contains four open reading frames (ORFs) upstream of ctsYZ and one ORF downstream. The first six ORFs, including ctsYZ, form a gene cluster, ctsUVWXYZ. The amino-acid sequences deduced from ctsUV are similar in to a sequence permease and a sugar-binding protein for the sugar transport system from Thermococcus sp. B1001. The third ctsW encodes a protein similar to CtsY, suggested to be another **isomaltosyltransferase** preferring panose to high-mol.-mass substrates.
REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 11 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 6
ACCESSION NUMBER: 2003:11017 CAPLUS
DOCUMENT NUMBER: 138:203778
TITLE: Production of cyclic tetrasaccharide from starch using a novel enzyme system from **Bacillus** globisporus C11
AUTHOR(S): Aga, Hajime; Higashiyama, Takanobu; Watanabe, Hikaru; Sonoda, Tomohiko; Nishimoto, Tomoyuki; Kubota, Michio; Fukuda, Shigeharu; Kurimoto, Masashi; Tsujisaka, Yoshio
CORPORATE SOURCE: Amase Institute, Hayashibara Biochemical Laboratories, Inc., Okayama, 700-0834, Japan
SOURCE: Journal of Bioscience and Bioengineering (2002), 94(4), 336-342
CODEN: JBBIF6; ISSN: 1389-1723
PUBLISHER: Society for Bioscience and Bioengineering, Japan
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Prodn. of cyclo(.fwdarw.6)-.alpha.-D-Glcp-(1.fwdarw.3)-.alpha.-D-Glcp-(1.fwdarw.6)-.alpha.-D-Glcp-(1.fwdarw.3)-.alpha.-D-Glcp-(1.fwdarw.) (CTS, cyclic tetrasaccharide) from starch was attempted using 1,6-.alpha.-glucosyltransferase (6GT) and 1,3-.alpha.-**isomaltosyltransferase** (IMT) from **Bacillus** globisporus C11. The optimal conditions for prodn. from partially hydrolyzed starch

were as follows: substrate concn., 3%; pH 6-7; temp., 30.degree.C; 6GT, 1 unit/g-dry solid (DS); IMT, 10 units/g-DS. The prodn. of CTS was demonstrated and 544 g of CTS hydrate crystal powders were obtained from 3500 g of partially hydrolyzed starch. Two major byproducts were also **isolated** from the reaction mixt. and identified as the branched derivs. of CTSs, 4-O-.alpha.-D-glucopyranosyl-CTS and 3-O-.alpha.-isomaltosyl-CTS.

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 12 OF 13 SCISEARCH COPYRIGHT 2004 THOMSON ISI on STN
ACCESSION NUMBER: 2003:247614 SCISEARCH
THE GENUINE ARTICLE: 654XF
TITLE: The current study of cyclo-tetrasaccharide focused on the synthesizing system from starch
AUTHOR: Nishimoto T
CORPORATE SOURCE: Hayashibara Biochem Labs Inc, Okayama 7000834, Japan
COUNTRY OF AUTHOR: Japan
SOURCE: TRENDS IN GLYCOSCIENCE AND GLYCOTECHNOLOGY, (NOV 2002) Vol. 14, No. 80, pp. 321-330.
Publisher: FCCA-FORUM CARBOHYDRATES COMING AGE, C/O GAKUSHIN PUBLISHING CO LTD 1-1-8 TARUMI-CHO, SUITA 564-0062, OSAKA, JAPAN.
ISSN: 0915-7352.
DOCUMENT TYPE: General Review; Journal
LANGUAGE: English
REFERENCE COUNT: 30

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB There are many oligosaccharides synthesized enzymatically. However, these are very few kinds of nonreducing glucooligosaccharides synthesized from starch. Examples of such oligosaccharides are trehalose and cyclodextrins. Cyclotetrasaccharide (CTS; cyclo {-->6)-alpha-D-glcp-(1-->3)-alpha-D-glcp(1--> 6)-(alpha-D-glcp-(1-->3)-alpha-D-glcp-(1-->}), is also one of the nonreducing glucooligosaccharides. A synthesizing system of this cyclic oligosaccharide from starch was recently found in **Bacillus** globisporus C11. CTS-synthesizing mechanism controlled by two enzymes and the sequence of the genes encording them were reported in succession. These studies indicate that there is a good possibility of industrial production of CTS and a gene cluster related to the synthesis and transport of CTS is present in microorganisms. This review summarizes the current study of CTS by focusing on the CTS-synthesizing system from starch.

L4 ANSWER 13 OF 13 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 7
ACCESSION NUMBER: 2001:868662 CAPLUS
DOCUMENT NUMBER: 136:2254
TITLE: .alpha.-**Isomaltosyltransferase** catalyzing synthesis of cyclic tetrasaccharide from **Bacillus** and **Arthrobacter**, **isolation**, and food, cosmetics, and pharmaceutical applications
INVENTOR(S): Kubota, Michio; Nishimoto, Tomoyuki; Aga, Hajime; Fukuda, Shigeharu; Miyake, Toshio
PATENT ASSIGNEE(S): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Japan
SOURCE: PCT Int. Appl., 158 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

WO 2001090338 A1 20011129 WO 2001-JP4276 20010522
W: JP, KR, US
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR
EP 1284286 A1 20030219 EP 2001-930244 20010522
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
PRIORITY APPLN. INFO.: JP 2000-149484 A 20000522
JP 2000-229557 A 20000728
WO 2001-JP4276 W 20010522

AB .alpha.-**Isomaltosyltransferase** capable of forming a cyclic tetrasaccharide having a cyclo { - 6} -.alpha.-D-glucopyranosyl- (1-3) -.alpha.-D-glucopyranosyl- (1-6) -.alpha.-D-glucopyranosyl- (1-3) -.alpha.-D-glucopyranosyl- (1 -) structure via a reaction involving .alpha.-isomaltosyl transfer starting from a saccharide having an .alpha.-1,6-glucosyl bond at the non-reducing end and an .alpha.-1,4-glucosyl bond at the other end and having a degree of glucose polymn. of at least 3, is provided. Also, recombinant expression of the above enzyme in microorganisms, use in prodn. of the cyclic tetrasaccharide, and use of such sugars in food, cosmetics, and pharmaceutical applications, are claimed. **Isolation** of the enzyme from **Bacillus** globisporus C9, C11, N75 strains, **Arthrobacter** ramosus S1, **Arthrobacter** globiformis, and **characterization** of catalytic activity, including substrate specificity, are described.

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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                                                           ENTRY    SESSION
FULL ESTIMATED COST                                         0.21       0.21

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Experimental and calculated property data are now available.  See HELP
PROPERTIES for more information.  See STNote 27, Searching Properties
in the CAS Registry File, for complete details:
http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf

=> e alpha-siomaltosylglucosaccharide synthase/CN
E1            1     ALPHA-RIBAZOLE-5'-PHOSPHATE PHOSPHATASE COBC (VIBRIO PARAHAE
                    MOLYTICUS STRAIN O3:K6 GENE VP1307)/CN
E2            1     ALPHA-RIBAZOLE-5-PHOSPHATE PHOSPHATASE (CLOSTRIDIUM TETANI S
                    TRAIN E88 GENE CTC00717)/CN
E3            0 --> ALPHA-SIOMALTOSYLGLUCOSACCHARIDE SYNTHASE/CN
E4            1     ALPHA-SOLUBLE NSF ATTACHMENT PROTEIN (ARABIDOPSIS THALIANA C
                    LONE RAFL05-18-K19 (R10410) GENE AT3G56450)/CN
E5            1     ALPHA-SPECTRIN (HUMAN GENE SPTA1)/CN
E6            1     ALPHA-STEP BSS 45/CN
E7            1     ALPHA-STEP M 40/CN
E8            1     ALPHA-STEP MC 48/CN
E9            1     ALPHA-STEP ML 40/CN
E10           1     ALPHA-STEP PC 48/CN
E11           1     ALPHA-SUBUNIT L-SERINE DEHYDRATASE (LACTOCOCCUS LACTIS LACTI
                    S STRAIN IL1403 GENE SDAA)/CN
E12           1     ALPHA-TUBULIN (GOSSYPIUM HIRSUTUM GENE TUBA1 C-TERMINAL FRAG
                    MENT)/CN

=> e alpha-isomaltosylglucosaccharide synthase/CN
E1            1     ALPHA-IDOSANE/CN
E2            1     ALPHA-INTERNEXIN (RATTUS NORVEGICUS)/CN
E3            0 --> ALPHA-ISOMALTOSYLGLUCOSACCHARIDE SYNTHASE/CN
E4            1     ALPHA-ISOPROPYLMALATE SYNTHASE (LEPTOSPIRA INTERROGANS ICTER
                    OHAEMORRHAGIAE STRAIN 56601 GENE CIMA)/CN
E5            1     ALPHA-ISOPROPYLMALATE SYNTHASE (LEPTOSPIRA INTERROGANS ICTER
                    OHAEMORRHAGIAE STRAIN 56601 GENE LEUA1)/CN
E6            1     ALPHA-ISOPROPYLMALATE SYNTHASE (LEPTOSPIRA INTERROGANS ICTER
                    OHAEMORRHAGIAE STRAIN 56601 GENE LEUA2)/CN
E7            1     ALPHA-KETO-BETA-HYDROXYL ACIL REDUCTOISOMERASE (STAPHYLOCOCC
                    US AUREUS STRAIN N315 GENE ILVC)/CN
E8            1     ALPHA-KETOGLUTARATE DEHYDROGENASE (BRADYRHIZOBIUM JAPONICUM
                    STRAIN USDA110 GENE SUCA)/CN
E9            1     ALPHA-KETOGLUTARATE DEHYDROGENASE (MESORHIZOBIUM LOTI STRAIN
                     MAFF303099 GENE MLL4301)/CN
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E10             1      ALPHA-KETOGLUTARATE DEHYDROGENASE E1 (RHODOPIRELLULA BALTICA
                       GENE KDGA)/CN
E11             1      ALPHA-KETOGLUTARATE PERMEASE (BACILLUS ANTHRACIS STRAIN AMES
                       GENE BA0921)/CN
E12             1      ALPHA-KETOGLUTARATE PERMEASE (BACILLUS ANTHRACIS STRAIN AMES
                       GENE CSBX)/CN

=> index bioscience
FILE 'DRUGMONOG' ACCESS NOT AUTHORIZED
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                                                           ENTRY    SESSION
FULL ESTIMATED COST                                         0.80       1.01

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       BIOCOMMERCE, BIOSIS, BIOTECHABS, BIOTECHDS, BIOTECHNO, CABA, CANCERLIT,
       CAPLUS, CEABA-VTB, CEN, CIN, CONFSCI, CROPB, CROPU, DDFB, DDFU, DGENE,
       DRUGB, DRUGLAUNCH, DRUGMONOG2, ...' ENTERED AT 15:21:20 ON 06 OCT 2003

67 FILES IN THE FILE LIST IN STNINDEX

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=> s alpha-isomaltosylglucosaccharide synthase
          2    FILE BIOTECHABS
          2    FILE BIOTECHDS
          4    FILE CAPLUS
         58    FILE DGENE
  24 FILES SEARCHED...
          1    FILE FSTA
  51 FILES SEARCHED...
          1    FILE TOXCENTER
          2    FILE WPIDS
          2    FILE WPINDEX

   8 FILES HAVE ONE OR MORE ANSWERS,    67 FILES SEARCHED IN STNINDEX

L1    QUE ALPHA-ISOMALTOSYLGLUCOSACCHARIDE SYNTHASE

=> d rank
F1           58    DGENE
F2            4    CAPLUS
F3            2    BIOTECHABS
F4            2    BIOTECHDS
F5            2    WPIDS
F6            2    WPINDEX
F7            1    FSTA
F8            1    TOXCENTER


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=> s l1
L2 10 L1

=> dup rem l2
PROCESSING COMPLETED FOR L2
L3 4 DUP REM L2 (6 DUPLICATES REMOVED)

=> d l3 ibib ab 1-4

L3 ANSWER 1 OF 4 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 1
ACCESSION NUMBER: 2003:417841 CAPLUS
DOCUMENT NUMBER: 139:11887
TITLE: Method of sustaining aroma with cyclic tetrasaccharides and use thereof
INVENTOR(S): Oku, Kazuyuki; Kubota, Michio; Fukuda, Shigeharu; Miyake, Toshio
PATENT ASSIGNEE(S): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Japan
SOURCE: PCT Int. Appl., 53 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003044143	A1	20030530	WO 2002-JP12196	20021121
W: KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				

PRIORITY APPLN. INFO.: JP 2001-358562 A 20011122
JP 2002-118439 A 20020419
JP 2002-256070 A 20020830

AB Disclosed are a method of sustaining an aroma which comprises blending an aroma substance with a cyclic tetrasaccharide or a hydrocarbonate deriv. of the cyclic tetrasaccharide; aroma-sustaining materials obtained by this method; compns. contg. the aroma-sustaining materials; aroma-sustaining agents having as the active ingredient the cyclic tetrasaccharide or a mixt. of the cyclic tetrasaccharide with a hydrocarbonate deriv. of the cyclic tetrasaccharide; and bactericides with the use of the sustained-releasing effect of the aroma-sustaining materials. A pretreated starch soln. was treated with .**alpha**.-**isomaltosylglucosaccharide synthase** and .alpha.-isomaltosyltransferase obtained from Bacillus globisporus to produce a cyclic tetrasaccharide. The obtained cyclic tetrasaccharide was mixed with ethanol or other liq. aroma compd. to make a sustained-release aroma compn.

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 2 OF 4 CAPLUS COPYRIGHT 2003 ACS on STN DUPLICATE 2

ACCESSION NUMBER: 2002:539841 CAPLUS
DOCUMENT NUMBER: 137:105736
TITLE: .**alpha**.-**Isomaltosylglucosaccharide** **synthase** from Bacillus and Arthrobacter catalyzing synthesis of cyclic tetrasaccharide, and food applications
INVENTOR(S): Kubota, Michio; Maruta, Kazuhiko; Yamamoto, Takuo; Fukuda, Shigeharu
PATENT ASSIGNEE(S): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Japan
SOURCE: PCT Int. Appl., 144 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002055708	A1	20020718	WO 2002-JP52	20020109

W: AU, CA, CN, JP, KR, US
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR

PRIORITY APPLN. INFO.: JP 2001-5441 A 20010112

AB .**alpha**.-**Isomaltosylglucosaccharide** **synthase** capable of forming a cyclic tetrasaccharide having a cyclo {.fwdarw.6}-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.6)-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.) structure via a reaction involving .alpha.-isomaltosyl transfer starting from a saccharide having an .alpha.-1,6-glucosyl bond at the non-reducing end and an .alpha.-1,4-glucosyl bond at the other ends and having a degree of glucose polymn. of at least 3, is provided. Also, recombinant expression of the above enzyme in microorganisms, use in prodn. of the cyclic tetrasaccharide, and use of such sugars in food, such as syrup, are claimed. Use of .alpha.-isomaltosyltransferase in combination with the above mentioned .**alpha**.-**isomaltosylglucosaccharide** **synthase** in the synthesis of cyclic tetrasaccharides and carbohydrates contg. it, is claimed. Bacillus globisporus, or Arthrobacter globiformis, can be used as expression host. Isolation of the enzyme from Bacillus globisporus C11, N75 strains, and Arthrobacter globiformis A19, and characterization of catalytic activity, including pH optimum, temp. optimum, and substrate specificity, are described. When maltose was used as substrate, glucose and .alpha.-maltosyl glucose (62-O-.alpha.-glucosyl maltose) were produced. From maltotriose, mainly maltose and .alpha.-maltosyl maltose (63-O-.alpha.-glucosyl maltotriose) were produced with minor prodn. of glucose, maltotetraose, .alpha.-maltosyl glucose, and .alpha.-isomaltosyl maltotriose (64-O-.alpha.-glucosyl maltotetraose). From maltotetraose, maltotriose and .alpha.-isomaltosyl maltotriose were the major products, with minor prodn. of maltose, maltopentaose, .alpha.-maltosyl maltose, and .alpha.-isomaltosyl maltotetraose (65-O-.alpha.-glucosyl maltopentaose).

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 3 OF 4 CAPLUS DUPLICATE 3
ACCESSION NUMBER: 2002:107521 CAPLUS
DOCUMENT NUMBER: 136:163295
TITLE: .**alpha**.-**Isomaltosylglucosaccharide** **synthase** from Bacillus and Arthrobacter catalyzing synthesis of cyclic tetrasaccharide, and food, cosmetics, and pharmaceutical applications
INVENTOR(S): Kubota, Michio; Tsusaki, Keiji; Higashiyama, Takanobu; Fukuda, Shigeharu; Miyake, Toshio

PATENT ASSIGNEE(S): Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Japan
SOURCE: PCT Int. Appl., 209 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002010361	A1	20020207	WO 2001-JP6412	20010725
W: AU, CA, CN, JP, KR, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
AU 2001080095	A5	20020213	AU 2001-80095	20010725
EP 1229112	A1	20020807	EP 2001-958377	20010725
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				

PRIORITY APPLN. INFO.: JP 2000-233364 A 20000801
JP 2000-234937 A 20000802
WO 2001-JP6412 W 20010725

AB .**alpha.-Isomaltosylglucosaccharide synthase** capable of forming a cyclic tetrasaccharide having a cyclo { - 6} -.alpha.-D-glucopyranosyl- (1-3) -.alpha.-D-glucopyranosyl- (1-6) -.alpha.-D-glucopyranosyl- (1-3) -.alpha.-D-glucopyranosyl- (1 -) structure via a reaction involving .alpha.-isomaltosyl transfer starting from a saccharide having an .alpha.-1,6-glucosyl bond at the non-reducing end and an .alpha.-1,4-glucosyl bond at the other end and having a degree of glucose polymn. of at least 3, is provided. Also, recombinant expression of the above enzyme in microorganisms, use in prodn. of the cyclic tetrasaccharide, and use of such sugars in food, cosmetics, and pharmaceutical applications, are claimed. Use of .alpha.-isomaltosyltransferase in combination with the above mentioned .**alpha.-isomaltosylglucosaccharide synthase** in the synthesis of cyclic tetrasaccharides and carbohydrates contg. it, is claimed. Maltooligosaccharide, maltodextrin, amylodextrin, amylose, amylopectin, sol., liquefied, or glutinous starch, and glycogen, are the donor saccharides. D-glucose, D-xylose, L-xylose, D-galactose, D-fructose, D-mannose, D-arabinose, D-fucose, D-psicose, D-sorbose, methyl-.alpha.-glucose, methyl-.beta.-glucose, N-acetylglucosamine, trehalose, isomaltose, isomaltotriose, cellobiose, gentiobiose, glycerol, maltitol, lactose, sucrose, or L-ascorbic acid, are the acceptor saccharides. The enzyme activity is stabilized by Ca2+, and Mn2+, and inhibited by Hg2+, Cu2+, and EDTA. Bacillus globisporus, or Arthrobacter globiformis, can be used as expression host. Isolation of the enzyme from Bacillus globisporus C9, C11, N75 strains, and Arthrobacter globiformis, and characterization of catalytic activity, including substrate specificity, are described.

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2003 ACS on STN
ACCESSION NUMBER: 2002:688160 CAPLUS
DOCUMENT NUMBER: 137:217171
TITLE: Preparation of carbohydrate mixture containing .alpha.-isomaltosylmaltotriose and sugar alcohols and method for production thereof
INVENTOR(S): Kubota, Norio; Nishimoto, Tomoyuki; Aga, Hajime; Fukuda, Yoshiharu; Miyake, Toshio
PATENT ASSIGNEE(S): Hayashibara Biochemical Laboratories, Inc., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 47 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent

LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2002255988	A2	20020911	JP 2001-60460	20010305

PRIORITY APPLN. INFO.: JP 2001-60460 20010305

AB A carbohydrate mixt. contg. cyclo[-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.6)-.alpha.-D-glucopyranosyl-(1.fwdarw.3)-.alpha.-D-glucopyranosyl-(1.fwdarw.6)] (.alpha.-isomaltosylmaltotriose or 64-O-.alpha.-glucosylmaltotetraose) (I) and sugar alcs. is prepd. by redn. of a carbohydrate mixt. contg. the cyclic tetrasaccharide compd. I and reducing sugars to decrease the reducibility. The starting carbohydrate mixt. is obtained by reaction of .alpha.-isomaltosylglucosaccharide with .alpha.-isomaltosyl transferase or reaction of partially hydrolyzed product of starch having DE (dextrose equiv.) of .ltoreq.20 with .**alpha**.-**isomaltosylglucosaccharide synthase** and .alpha.-isomaltosyl transferase. Also disclosed are beverages, in particular low calorie beverages, cosmetics, or drugs contg. the above carbohydrate mixt. The present carbohydrate mixt. is a stable sweetening agent which is useful as a taste or flavor improver, quality improver, or excipient for beverages, food, feed, cosmetics, or drugs. Thus, a liq. fermn. medium (100 mL) contg. Pindex 1 5, yeast ext. (Asahi Meast) 1.5, k2HPO4 0.1, NaH2PO4.12H2O 0.06, MgSO4.7H2O 0.05 wt./vol. % and H2O was sterilized under heating at 120.degree. for 20 min, cooled, inoculated by Bacillus globisporus C9 (FERM BP-7143), shake-cultured at 27.degree. for 48 h, and centrifuged to obtain a supernatant liq. which was heated at 120.degree. for 15 min, cooled, and centrifuged to give a supernatant liq. The supernatant liq. (90 mL) was adjusted to pH 5.0 and warmed to 40.degree., treated with 1,500 unit .alpha.-glucosidase (transglycosidase L [Amano] J) and 75 unit glucoamylase (Nagase Biochem. Industry Inc., Japan) for 24 h, adjusted to pH 12, boiled for 2 h to decomp. residual reducing sugars, filtered, and desalted by Diaion PK218 and Diaion WA30 and then again with Diaion SK-1B and IRA 411 to give .apprx.0.6 g I (99.9% purity). I was stable in aq. AcOH (pH 3.0-5.0), Tris-HCl buffer (pH 6.0-8.0), ammonium buffer (9.0-10.0) at 100.degree. for 24 h and was not hydrolyzed by saliva amylase, and formed inclusion complexes with MeOH, EtOH, and AcOH. The two enzymes, i.e. .**alpha**.-**isomaltosylglucosaccharide synthase** and .alpha.-isomaltosyl transferase, were isolated and purified from the fermn. broth obtained similarly by fermn. of B. globisporus C9. In another expt., a fermn. broth of B. globisporus C9 contg. 8.8 unit/mL .alpha.-isomaltosyl glucosaccharide synthetase and 26.7 unit/mL .alpha.-isomaltosyl transferase was added at 0.25 mL/1 g starch to 2% aq. 1 mM potato starch contg. 1 mM CaCl2, adjusted to pH 6.0, stirred at 35.degree. for 48 h, heated at 95.degree. for 10 min, purified by decolorization and desaltation, and concd. to give a 40% syrup contg. I which was hydrogenated in the presence of 6% Raney nickel at 120.degree. and 20-120 kg/cm2, filtered to remove the catalyst, purified by decolorization and desaltation, and concd. to give a 70% syrup contg. I 62.1, sorbitol 0.7, isomaltitol 1.4, maltitol 11.1 and other sugars 24.7%. The carbohydrate mixt. exhibited mild sweetness, moderate viscosity, moisturizing property, and inclusion property.

=> log Y

Refine Search

Search Results -

Terms	Documents
(alpha isolmaltosylglucosaccharide synthase)	0

Database:
US Pre-Grant Publication Full-Text Database
US Patents Full-Text Database
US OCR Full-Text Database
EPO Abstracts Database
JPO Abstracts Database
Derwent World Patents Index
IBM Technical Disclosure Bulletins

Search: L1

Refine Search

Recall Text | Clear | Interrupt

Search History

DATE: Wednesday, January 28, 2004 Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI; PLUR=YES; OP=ADJ			
L1	(alpha isolmaltosylglucosaccharide synthase)	0	L1

END OF SEARCH HISTORY

h e b b cg b e e ch